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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,883	10/03/2003	Kurt Haller	5589-04901 P1068	2324

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EXAMINER	
LEE, HSIEN MING	
ART UNIT	**PAPER NUMBER**
2823	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

10

Office Action Summary	**Application No.** 10/678,883	**Applicant(s)** HALLER ET AL.
	Examiner Hsien-ming Lee	**Art Unit** 2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 05 October 2006.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 20 and 21 is/are allowed.

6)☒ Claim(s) 1-3,8,10-16 and 19 is/are rejected.

7)☒ Claim(s) 4-7, 9, 17 and 18 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

HSIEN-MING LEE
PRIMARY EXAMINER

12/22/06

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

1. The 112-second paragraph rejection against claims 1 and 16 and 102(e) rejection against claims 1, 3, 8, 10, 11, 13-16 and 19 have withdrawn in response to applicant's amendments and arguments filed 10/5/2006.

Grounds of Rejections

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 8, 10-16, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wooten et al. (US 6,156,580).

In re claim 1, Wooten et al. teach a computer-implemented method (col. 1, lines 47-48), comprising using laser to **inspect** both front-side defects and back-side defects of a wafer (col. 1, lines 55-60) and col. 5, lines 48-51); and downloading the front-side and back-side inspection data to a microscope review station 110 (col. 1, line 63 through col. 2, line 3 and col. 2, lines 14-23) to **review** the front-side defects and the back-side defects to **determine** if these defects present certain **coordination** (col. 4, lines 14-17 and col. 8, lines 36-52) and thus to judge if the wafer is acceptable (col. 4, lines 17-19).

Although Wooten et al. do not expressly teach correlating a back-side defect with a front-side defect detected a specimen, one of the ordinary skill in the art would have been motivated review the front-side and back-side defects at certain coordinates (col. 4, lines 14-17) to determine a qualitative and/or quantitative **mutual relation** between the front-side defect and the back-side defect. This is because correlating the back-side defect with the front-side defect can be reasonably interpreted as finding a **mutual relation** between the front-side defects and the backside defects via reviewing the front-side and backside defects at a certain coordinate (col. 4, lines 14-17). Finding the mutual relation would involve determining if a portion of the backside defect has correlation with a portion of the front-side defect or if a portion of the backside defect matches a portion of the front-side defect.

In re claim 2, one of the ordinary skill in the art would have readily appreciate that by inspecting the front-side and back-side defects (col. 8, lines 36-52) it would be able to determine the **mutual relation** or correlation between the front-side defect and the back-side defect, because "inspecting" would include a determination of any relationship between the front-side defects and the back-side defects, such as an alignment between the front-side defect pattern and the back-side defect pattern.

In re claim 3, Wooten et al. teach generating a single visual representation of the specimen by transmitting the inspection defect data to the microscope review station 108 and 110 (Fig. 1) and to a control computer (col. 9, lines 6-7 and 13-14) to generate a visual representation for visual review (e.g. download inspection data to microscope station for visual review, col. 9, lines 21-22, 31-32 and col. 10, lines 56-57).

In re claims 8 and 10, Wooten et al. teach the claimed limitations because by **reviewing** the front-side defects and the back-side defects to **determine** if these defects present certain **coordination** (col. 4, lines 14-17 and col. 8, lines 36-52), one of the ordinary skilled in the art would be able to determine if a portion of the back-side defect is opposite to a portion of the front-side defect and to classify the defects, e.g. to see if the defect patterns are point-defect or line-defect or irregular shape defects via the microscope view station as taught by Wooten et al.

In e claims 11 and 13, one of the ordinary skill in the art would have been motivated to use Wooten's teachings to classify the defects, as stated in the rejection against claims 8 and 10, and further to determine a root cause of the back-side defect (e.g. unwanted debris or contaminants) from data representing process history of the specimen while the microscope view station as taught by Wooten et al. obviously is capable of classifying and analyzing the defect data.

In re claim 12, one of the ordinary skill in the art would have been motivated to use Wooten's teachings to classify the defects, as stated in the rejection against claims 8 and 10, and to determine parameters for the classifying because analyzing and categorizing the defect pattern as taught by Wooten would include classifying the defects and determining parameters for the classifying.

In re claims 14 and 15, one of the ordinary skill in the art would have been motivated to use Wooten's teachings to classify the back-side defect and to alter a parameter of a process tool in response to the classification or in response to the back-side defect to reduce occurrence of the front-side defect on additional specimen since Wooten teaches analyzing and categorizing the defect pattern and altering the parameter of a process tool, such as the position of wafer inverters 114 and 116 in the microscope review station 110. By analyzing and categorizing the defects and altering the positions of the wafer inverters it would lead to reduce occurrence of the front-side defect.

In re claims 16 and 19, one of the ordinary skill in the art would have been motivated to use Wooten's teachings to correlate a back-side defect detected on a back-side of a specimen with a front-side defect detected on a front-side of the specimen, as stated in the rejection against claim 1, and thus to see if the back-side defect and the front-side defect satisfy one or more proximity criteria, because a criteria for selecting the wafer has certain characteristics in the specimen (col. 6, lines 25-29).

Allowable Subject Matter

4. Claims 20 and 21 are allowed.

5. Claims 4-7, 9, 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

In re claim 4, the prior art of record does not teach or suggest *identifying data representative of a signature of a chuck* of a process tool with data generated during detection of the backside defect and *removing the data representative of the signature of the chuck* from data generated during detection of the backside defect prior to the correlating.

In re claim 5, the prior art of record neither teaches nor suggests *altering* one of the visual representations such that the altered visual representation appears as a *mirror image* of the one visual representation, and *superimposing* the altered and the unaltered visual representations to generate an overall visual representation of the specimen.

In re claim 9, the prior art of record neither teaches nor suggests *altering the coordinates* defining the location of the backside defect or the coordinates defining the location of the frontside defect prior to the comparing.

In re claim 17, the prior art of record neither teaches nor suggests defining the backside defect as a *geometrical figure* having lateral dimensions *larger than* the backside defect, wherein the one or more proximity criteria are satisfied if at least a portion of the geometrical figure is opposite to at least a portion of the frontside defect.

In re claim 18, the prior art of record does not teach or suggest defining the frontside defect as a *geometrical figure* having lateral dimensions *larger than* the frontside defect.

In re claim 20, the prior art of record, either alone or combination, at least does not teach or suggest determining if data generated during detection of the backside defects is *representative of a signature of a chuck* of a process tool and *removing the data representative of the chuck* from data generated during detection of the backside defects.

Response to Arguments

7. Applicant's arguments filed 10/5/2006 with respect to the rejection against claims 1-3, 8, 10-16, 19 have been fully considered but they are not persuasive for the reasons as follows.

Applicant asserted that "**cited art does not teach or suggest correlating a backside defect detected on a specimen with a frontside defect detected on the specimen**" (page 11); and 'Wooten does not teach or suggest using the coordinates of the front side defect and the back side defect to "determine if these defects present certain coordination" or for "coordinating the front-side and back-side defects" '(second paragraph on page 12).

In response to the foregoing arguments, Wooten teach inspecting frontside defects and backside defects at the same laser scanning station (col. 4, lines 39-43 and col. 5, lines 53-56) and thus reviewing both frontside defects and backside defects on the same microscope review station (col. 4, lines 43-45 and col. 5, lines 56-58). The revealed defects are present at a certain coordinate (col. 4, lines 15-17). When both frontside defects and backside defects are present at the certain coordinates at the microscope review station, one of the ordinary skill in the art would readily appreciate any correlation between the frontsdie defects and the backside defects based on any defect pattern located at the certain coordinates. For example, the front side of the specimen has circular-shaped black spots (i.e. the frontside defects) located at the same coordinates as the backside of the specimen which has also similar black-spot defect pattern. In other word, by reviewing the frontside defects and the backside defects at the same microscope review station, the ordinary skilled in the art would be able to correlate the frontside defects and the backside defects based on the defect patterns located at corresponding coordinates on the frontside and the backside of the specimen.

After all, Wooten's teachings are illustrative rather than restrictive. One of the ordinary skill in the art should not be limited to the particular example taught in the patent (col. 7, lines 15-18, Wooten). Rather, to correlate the frontside defects and the backside defects based on the inspection data present on the same microscope review station is readily apparent to those skill in the art upon review of Wooten's entire teachings (col. 7, lines 19-23).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-ming Lee whose telephone number is 571-272-1863. The examiner can normally be reached on Monday, Tuesday and Thursday (7:30 ~ 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hsien-ming Lee
Primary Examiner
Art Unit 2823

Dec. 22, 2006

HSIEN-MING LEE
PRIMARY EXAMINER
12/22/06